

Fig. 4. *Lagena Feildeniana*, n. sp., magn. 75 diam.

Fig. 5. *Polymorphina acuminata*, D'Orbigny, magn. 75 diam.: *a*, periphery-lateral aspect; *b*, end view.

Fig. 6. *Polymorphina rotundata*, Bornemann, magn. 65 diam.: *a*, periphery-lateral aspect; *b*, end view.

Fig. 7. *Uvigerina pygmaea*, D'Orbigny, var., magn. 90 diam.

Fig. 8. *Textularia bififormis*, Parker & Jones, magn. 90 diam.

Fig. 9. *Verneulina polystropha*, Reuss, magn. 90 diam.

PLATE XXI.

Fig. 10. *Globigerina bulloides*, D'Orbigny, arctic variety, magn. 100 diam.: *a*, superior or spiral face; *b*, inferior aspect; *c*, peripheral aspect.

Fig. 11. *Pulvinulina Karsteni*, Reuss, magn. 50 diam.: *a*, superior; *b*, inferior; *c*, peripheral aspect.

Fig. 12. *Bulimina elegantissima*, D'Orbigny, var., magn. 90 diam.

Fig. 13. *Polystomella arctica*, Parker & Jones: *a*, lateral, *b*, peripheral aspect, magnified 30 diam.; *c*, horizontal section, showing the laminated thickening of the shell-wall and its minute tubulation, magn. 40 diam.; *d*, horizontal section of part of the outer convolution, more highly magnified, showing the bifurcation of the sutural orifices, magn. 100 diam.

L.—Descriptions of new Species of Heterocera from Japan.—
Part III. *Geometrites*. By ARTHUR G. BUTLER, F.L.S.,
F.Z.S., &c.

[Continued from p. 406.]

Zerenidæ.

ABRAXAS, Leach.

196. *Abraxas conspurcata*, n. sp.

Wings white, black at the base; black discocellular blotches, two parallel discal series of subconfluent black blotches, between which runs an orange line; a confluent series of marginal black blotches: primaries with the base orange-streaked; a central costal black patch confluent with the discocellular blotch; two subbasal black blotches. Body orange, spotted with black; the head and thorax black, but the back of the collar and tegulæ orange. Expanse 1 inch 7 lines.

Yokohama (*Jonas*).

This species is much like some extreme heavily spotted varieties of *A. grossulariata*; but it may be readily distinguished from them all by the two discal series of large spots or blotches being nearer to the outer margin and complete in the secondaries as well as in the primaries, also in the secondaries being broadly black at the base.

197. *Abraxas miranda*, n. sp.

Allied to *A. leopardinata* from India, but larger; the primaries with broader and darker basal and internal patches; the costa blotched with grey throughout, the patch over the end of the cell much larger and confluent with the costal patch; the transverse grey belt below it placed nearer to the middle of the wing and *touching the dark internal patch*; two confused parallel discal series of grey blotches; a number of small grey spots forming two imperfect parallel series on externo-discal area: the secondaries with a *complete* grey belt across the cell; two somewhat confused discal series of grey blotches terminating in the usual dark internal patch; external area spotted with grey; marginal blotches partially *confluent*. Body similar. Expanse, ♂ 2 inches, ♀ 2 inches 4 lines.

Yokohama (*Jonas*).

198. *Abraxas placida*, n. sp.

White, with ochraceous body; wings with ochreous outer border and black-spotted orange fringe; an externo-discal series of black spots, imperfect in secondaries; base ochraceous, spotted with black: primaries with three subbasal blackish spots; an irregular central band formed of blackish blotches; two black costal spots near apex: secondaries with a central irregular band formed of blackish lines: shoulders and palpi blackish. Wings below nearly as above. Expanse 1 inch 5 lines.

Hakodaté (*Whitely*).

EUCHERA, Hübner.

199. *Euchera Agnes*, n. sp.

Wings white, with broad smoky-grey outer border, crossed by a more or less confluent series of white or whitish lunules parallel to the outer margin: primaries sometimes with the lunules very indistinct; base and a subcostal streak ochreous; basal area covered by about ten grey spots in three series; a central broad belt, externally angulated, composed of grey blotches: secondaries with a grey belt almost surrounding the discoidal cell: body ochreous. Wings below white, the markings almost as above, but blackish and narrower; white lunules confluent and well-defined on all the wings, blackish discocellular spots: primaries only ochreous on the costal border, the basal area only marked with one large blackish

blotch: body below white; abdomen belted with grey. Expanse 2 inches 6-8 lines.

Yokohama (*Jonas*); Hakodaté (*Whitely*).

DEROCA, Walker.

200. *Deroa phasma*, n. sp.

♂. Hyaline, snow-white: primaries with three grey spots across the basal half of the costa, a fourth above the end of the cell, and a larger spot at the end of the cell; a large apical patch crossed by a trifold white patch, and a similar smaller patch at the external angle grey: antennæ with grey pectinations; abdomen grey, crossed by white segmental lines. Wings below nearly as above, but the grey markings darker and the costal spots on the basal half confluent; body below cream-coloured. Expanse 1 inch 4 lines.

♀. Larger, iridescent, and with much paler markings. Expanse 1 inch 6 lines.

Yokohama (*Jonas*).

LOMASPILIS, Hübner.

201. *Lomaspilis opis*, n. sp.

Wings creamy white: primaries with the basal fourth, three large blotches across the centre (the two uppermost confluent), the apex, outer margin, and external angle pale purplish brown: secondaries with three blotches across the centre, the apex, a subapical marginal spot, outer margin, and anal angle pale purplish brown. Body brown, legs testaceous. Expanse 1 inch 1 line.

Yokohama (*Jonas*).

Nearly allied to the European *L. marginata*, but differing in the brown blotches across the centre of the wings.

Ligiidæ.

PACHYLIGIA, n. gen.

Allied to *Ligia*, with similar antennæ and neuration; the body much more robust, broader; the primaries much wider, with more strongly defined external angle; fringe shorter. Type *P. dolosa*.

202. *Pachyligia dolosa*, n. sp.

Primaries fuliginous brown, varied with bronzy brown; base longitudinally streaked with black; two irregularly sinuated central black lines, and between them an irregular

blackish stripe; upper discocellular black; outer border bronzy, with undulated inner edge; a submarginal series of dark brown spots; margin undulated; fringe pale at base: secondaries sordid white, with pinky brown outer border and darker brown fringe; upper discocellular black: head and thorax brown; abdomen testaceous; antennæ testaceous. Primaries below greyish, with testaceous costa; outer border slightly paler; a black discocellular dot: secondaries whitish brown, with testaceous costa; fringe and an anal streak dusky; a large black discocellular spot. Expanse 1 inch 11 lines.

Yokohama (*Jonas*).

203. *Pachyligia modesta*, n. sp.

♂. Primaries silvery whitish, crossed by two slender irregularly dentate and crinkled blackish lines; a third paler line limiting the outer border: secondaries slightly browner in tint than the primaries, crossed in the middle by an irregularly sinuated grey line; margin slenderly blackish; fringe silvery whitish: head and thorax grey; antennæ with brown pectinations; abdomen testaceous. Under surface pale whitish brown: wings with the costal borders testaceous; each wing with a dentate-sinuate grey discal line and a blackish marginal line. Expanse 1 inch 9 lines.

Yokohama (*Jonas*).

The single female example obtained is darker than the male, the primaries being varied with bronzy brownish, and the area enclosed by the blackish lines distinctly grey; this example, however, is small and has the primaries so much narrower than other examples of this genus that I suspect it to be aborted.

Hyberniidæ.

HYBERNIA, Latreille.

204. *Hybernia dira*, n. sp.

General character of *H. leucophæaria*: primaries fuliginous brown, streaked here and there with tawny; a central irregular black-edged and speckled pale greyish belt, concave internally, unequally bisinuated externally; base greyish; outer border pale, bordered internally by an irregularly sinuated white line; a series of black marginal spots; fringe white, grey-speckled at base: secondaries pale greyish, speckled with grey, streaked with blackish on the abdominal area at anal angle; a black marginal line: body grey, black-spotted. Under surface greyish: wings with bronze-tinted borders and

blackish discocellular dots: secondaries speckled with grey. Expanse 1 inch 6 lines.

Yokohama (*Jonas*).

Most nearly allied to *H. obliquaria* of Motschoulsky.

Larentiidae.

LARENTIA, Duponchel.

205. *Larentia Hemana*, n. sp.

Closely allied to *L. salicata*, but the central band of primaries of nearly twice the width, the wings altogether paler, and the secondaries similar in marking to *L. caesiata*. Expanse 1 inch 2 lines.

Yokohama (*Jonas*).

Unless carefully compared with *L. salicata* of Europe, this species might easily be confounded with it.

EUPITHECIA, Curtis.

206. *Eupithecia sophia*, n. sp.

Allied to *E. denticulata* of Europe; sordid white with pale greyish outer borders and fringes to the wings, and black discocellular spots: primaries with the basal half of costa and the basal area blackish, crossed by irregular white lines; remainder of the wing crossed alternately by grey belts and white lines, the widest of which form an indistinct central oblique band; all the lines zigzag: secondaries crossed by one or two indistinct greyish lines. Wings below whiter, shining, the markings of the primaries only visible through the wings, excepting upon the costal border. Expanse 9 lines.

Yokohama (*Jonas*).

207. *Eupithecia invisä*, n. sp.

Pale silky greyish; external area of wings crossed by five slightly irregular parallel grey lines, most distinct on the primaries, the two inner lines dotted with black upon the nervures; discocellular spots black: primaries with the costa dusky, crossed by dark spots; a very ill-defined oblique belt across the centre of the wing, but scarcely darker than the ground-colour. Under surface whitish; the discal lines indicated by a series of dusky spots, two at costa of primaries blackish; discocellular spots black. Expanse 1 inch.

Hakodaté (*Whitely*).

This species is allied to the preceding; owing to its greyer tint it is much less like *E. denticulata*.

208. *Eupithecia excisa*, n. sp.

Nearly allied to *E. succenturiata* of Europe, but differing in its smaller size, greyer primaries, and in the front margin of the central belt of primaries being deeply and angularly notched beyond the discoidal cell. Expanse 11 lines.

Yokohama (*Jonas*).

209. *Eupithecia rufescens*, n. sp.

Apparently allied to *E. satyrata* of Europe, but much larger and with considerably longer palpi; an oblique subbasal belt and the external area of the primaries laky brown; a black marginal line enclosed in and interrupted upon the veins by a white line. Expanse 11 lines.

Yokohama (*Jonas*).

210. *Eupithecia proterva*, n. sp.

Allied to *E. innotata*, larger; the primaries still more produced, pale smoky grey: primaries with the base, a subbasal band, an oblique whitish-edged central belt (angular, excised above the median vein), and the external area blackish; a crinkled whitish submarginal line; discocellulars black: secondaries covered with parallel dusky lines, which become black upon the veins. Wings below grey; the discocellulars, two discal series of dots, and a marginal series black. Expanse 1 inch.

Yokohama (*Jonas*).

211. *Eupithecia caliginea*, n. sp.

Near to *E. pygmæata*, but the ground-colour of the wings black instead of sooty grey; the crinkled lines across the primaries formed of white scales. Expanse 10 lines.

Yokohama (*Jonas*).

This is the Japanese representative of *E. pygmæata*.

COLLIX, Guénée.

212. *Collix Vashti*, n. sp.

Dark fuliginous brown; the wings crossed by from eighteen to twenty parallel undulated blackish or black lines, more or less dotted with white upon the nervures; submarginal line indistinctly white-edged on the primaries; marginal line well-defined and black, the sinuations filled by white dots on the fringe: secondaries with all the lines less distinct than

on the primaries. Under surface sericeous, the blackish lines ill-defined. Expanse 1 inch 2-8 lines.

Hakodaté (*Whitely*).

LOBOPHORA, Curtis.

213. *Lobophora julia*, n. sp.

Primaries above pale purplish brown, crossed by numerous irregularly crinkled or zigzag blackish lines; two pale green belts across the basal area, and a zigzag discal belt of the same colour, edged internally with white; a slender zigzag submarginal white line; a large black discocellular spot: secondaries pale shining grey, the disk crossed by several parallel slightly darker lines. Abdomen banded with testaceous. Wings below pale silvery grey, with black discocellular dots; a blackish macular discal line, and a zigzag pale grey submarginal line. Expanse 1 inch.

Yokohama (*Jonas*).

This species, excepting in its long palpi, somewhat resembles *Eupithecia togata*.

214. *Lobophora volitans*, n. sp.

♂ ♀. Wings white: primaries shining, more or less densely sprinkled with grey scales, and crossed by a basal and two central black-edged sap-green bands; a discal sinuated black-edged white stripe, more or less obscured by grey scales; outer border greenish, with a marginal series of black T-shaped markings terminating the veins; the veins throughout black-banded: secondaries with a discal line and a sinuated submarginal line pale grey; a dark grey marginal line. Body grey, varied with brown, and spotted here and there with black; legs black, banded with white. Under surface sordid sericeous whitish: wings crossed by two greyish discal lines; blackish linear discocellular and marginal dots. Expanse 1 inch 2 lines.

Yokohama (*Jonas*).

Var. *elegans*.

♂. Primaries with the basal and central bands reddish brown instead of green; the outermost or discal band being more distinctly lunulated and white internally. Expanse 1 inch 2 lines.

Yokohama (*Jonas*).

215. *Lobophora terranea*, n. sp.

Similar in form to the preceding, but the wings smaller

and rather narrower, grey: the primaries crossed by three basal, two more or less confluent central belts, and one discal sinuated belt; basal and apical areas suffused with red-brown; central belts red-brown with blackish outlines; other belts outlined in blackish; veins banded with blackish; a series of marginal dots: secondaries with whitish costal area; a submarginal pale grey line. Under surface sericeous grey. Expanse 1 inch 2 lines.

Yokohama (*Jonas*).

Allied to *L. polycommata*.

LYGRANOVA, n. gen.

Allied to *Lobophora*, but the primaries broader and more acuminate, the discoidal cell considerably shorter, the second and third median branches emitted much closer together, the upper radial emitted from the end of the cell instead of from the postdiscoidal cellule; antennæ strongly pectinate in the male. Type *L. fusca*.

216. *Lygranova fusca*, n. sp.

Pale brown, wings with slender blackish marginal line, followed by a yellowish line at the base of the fringe: primaries with dusky base; an abbreviated black costal dash across the end of the cell, and a second halfway between the cell and apex; two irregular subparallel brown lines running from the costal dashes across the wing to inner margin; a subapical black costal spot; fringe whitish, intersected by a grey stripe. Wings below sericeous whity brown; discocellular dots and a discal series grey: primaries with bronzy borders; fringe as above, but more decidedly grey-spotted at the ends of the veins. Expanse 11 lines to 1 inch 2 lines.

Yokohama (*Jonas*); Hakodaté (*Whitely*).

MELANTHIA, Duponchel.

217. *Melanthia casta*, n. sp.

Nearly allied to *M. albicillata*, but larger; the markings more sharply defined and blackish; the macular subapical portion of the interrupted discal stripe bifid, not trifid, and therefore not united to the large costal patch; discocellular spots black and well defined. Wings below with darker markings; the macular discal stripe well defined in the secondaries as well as the primaries. Expanse 1 inch 6 lines.

Hakodaté (*Whitely*).

MELANIPPE, Duponchel.

218. *Melanippe inquinata*, n. sp.

Closely allied to *M. procellata* of Europe, but larger; the wings always more or less suffused with grey, sometimes only enough to make them look sordid, sometimes so dark as almost to conceal the ordinary markings: primaries with the basal dark patch broader, and the dark outer border of twice the width. Expanse 1 inch 7 lines.

Yokohama (*Jonas*); Hakodaté (*Whitely*).

219. *Melanippe bella*, n. sp.

Allied to the preceding, but with unusually small secondaries: wings white, suffused, excepting at the borders, with stramineous; the apical and external or anal borders blotched with red-brown and bounded internally by a discal series of blackish rounded spots, interrupted on each wing upon the second median interspace; black discocellular spots: primaries with the costal border spotted with red-brown and grey, most broadly above the end of the cell; a tawny spot near the base of inner margin; two or three very indistinct slender brownish lines across the wing, the outermost one zigzag: secondaries with a grey basal stripe, a central grey elbowed belt, and an arched grey stripe just beyond the middle: body white, head sordid, antennæ black. Wings below with all the markings black or grey; a central belt followed by a grey streak on all the wings; basal area of primaries greyish: body grey, whitish in front; legs varied above with black and white. Expanse 1 inch 4-6 lines.

Yokohama (*Jonas*); Hakodaté (*Whitely*).

220. *Melanippe supergressa*, n. sp.

Closely allied to *M. rivata* of Europe, the markings blacker, the discal white belt beyond the central band broader; the base of secondaries white, irrorated with grey, but not densely; three central parallel dark grey lines not reaching the costa: wings below with the markings better defined. Expanse 1 inch 1 line.

Hakodaté (*Whitely*); Yokohama (*Jonas*).

The whiter base to the secondaries and blacker bands are the best characters for distinguishing this species from its European congener.

221. *Melanippe hecate*, n. sp.

Black, mottled indistinctly with grey: wings with the fringes spotted with white; a broad irregular white band just

beyond the middle, strongly angulated on the primaries; these wings also with a double submarginal series of pale spots; the inner series with one upon the costa, and a second just beyond the angle of the irregular band, white: back of head white, antennæ dotted with white, abdomen with white margins to the segments. Wings below greyer than above, the basal area crossed by parallel transverse whitish streaks; body white. Expanse 1 inch 4 lines.

Yokohama (*Jonas*).

Allied to *M. furcifascia*, but the white band broader, more strongly angulated on the primaries, and continued through the secondaries.

ANTICLEA, Stephens.

222. *Anticlea consanguinea*, n. sp.

Nearly allied to *A. berberata* of Europe, but of a more uniformly grey colour: primaries with the bands broader, the subbasal band more regular, the dark band just before the middle of the wing distinctly angulated above the median vein; the discal band less strongly dentated; outer border broadly dusky, completely obliterating the sinuated submarginal lines: secondaries greyish brown, crossed beyond the middle by an angulated and sinuated dusky line. Wings below similar in colouring to those of *A. berberata*, but with a strongly defined continuous discal line. Expanse 1 inch 2 lines.

Hakodaté (*Whitely*).

COREMIA, Guénéé.

223. *Coremia livida*, n. sp.

Allied to *C. ferrugata*, but uniformly greyish brown; the basal bands more decidedly undulated, and only indicated in outline by dark lines; the broad dark belt further from the base, its margins more decidedly undulated, its inner margin more irregular, its outer margin less decidedly angulated; outer border smoky grey, bounded by a continuous series of white-edged dark lunules, those spots which are dark in *C. ferrugata* being only slightly darker than the others; the zigzag discal line of the European species replaced by a sinuated line forming an internal boundary to the submarginal lunules; lines across the secondaries less strongly defined: wings below more uniform in tint and sericeous grey, with the sinuated parallel lines arched rather than angulated. Expanse 1 inch 1 line.

Yokohama (*Jonas*).

224. *Coremia frigida*, n. sp.

White, the primaries spotted at the base with black and smoky brown; two central angulated black lines, indicating the usual band, the outer one diffused internally above the middle; a black spot at the end of the cell; outer border smoky brown, margined and traversed internally by two black lines parallel to the outer of the two central lines; veins upon the border black, each with a central white dot, the whole together forming a submarginal series; fringe white-spotted: secondaries silver-grey, with the external area regularly white; a marginal series of dark grey spots which run through the fringe; a blackish discocellular spot: body whitish, greyish in front, dotted with black; antennæ black annulated with white. Primaries below with the basal two thirds silver-grey, crossed near the base by two grey stripes visible only from the transparency of the wing, the inner one marked with two blackish spots; an oblique black fasciole across the end of the cell, partly limiting the grey area; an angulated white discal belt, followed by a black border; a white subapical costal dot, and a series on the fringe: secondaries as above: body below white. Expanse 1 inch.

Yokohama (*Jonas*).

A beautiful little species, in pattern most nearly resembling "*Coremia*" *heliacaria*; the latter, however, has strongly pectinate antennæ in the male.

CIDARIA, Treitschke.

225. *Cidaria melancholica*, n. sp.

Allied to *C. silaceata*, but considerably larger, the white line nearest to the base of primaries more regular, not succeeded by a yellow line; the line which follows it (indicating the inner edge of the central band) acutely angulated upon the median vein; the lines and veins on the external area, which are yellow in *C. silaceata*, pale testaceous or sordid whitish; a small blue-pupilled ocellus beyond the discoidal cell; secondaries smoky grey throughout, with the usual sinuated white-edged discal lines. Expanse 1 inch 10 lines.

Yokohama (*Jonas*).

Typical *C. silaceata* seems to be common in Japan.

226. *Cidaria obscura*, n. sp.

Most like very dark varieties of *C. russata*, but altogether darker and with a different pattern on the underside. Greyish brown, the primaries with a pink tinge, markings extremely

like those of *C. russata*, dark brown, limited by pale-bordered black lines; a slightly sinuated black outer margin and grey-tipped fringe: secondaries with dusky external border, on which there is an indication of a paler submarginal sinuated line; a black scalloped marginal line; fringe grey, with pale basal line. Wings below grey, with pale testaceous costal borders; dusky discocellular dots; three parallel darker grey postmedian lines, followed by a whity-brown broadly sinuated discal belt; a submarginal dusky belt followed by an ill-defined undulated pale line; outer border grey; fringe whity brown: body whity brown. Expanse 1 inch 5 lines.

Yokohama (*Jonas*).

C. russata is common in Japan.

227. *Cidaria ærosa*, n. sp.

Closely allied to *C. reticulata*, but nearly twice as large and with all the lines of primaries brassy yellow instead of white; secondaries and body tinted with brassy yellow; under surface pale brassy yellow, with indistinct greyish markings similar to those of *C. reticulata*. Expanse 1 inch 9 lines.

Hakodaté (*Whitely*).

228. *Cidaria tetrica*, n. sp.

Nearest to *C. suffumata*, but considerably larger; the primaries mottled all over with olivaceous, with diffused bronzy borders to the veins; the markings may be thus described:—Wings dark brown, crossed by three silvery bands, all of which are forked, the first two from the median vein, the third from the upper radial or inferior subcostal branch; central band twice as wide as the others; between each two bands and between the external band and outer margin a slender silvery more or less sinuated line; a marginal series of silvery spots with black centres: secondaries white, speckled with grey; two parallel discal grey lines, on the outer one several blackish spots; a marginal series of blackish spots; fringe yellowish: body brown, banded with pale yellow and white. Under surface shining white: primaries mottled with grey; costa speckled with black: secondaries speckled with brown and grey; a brown discocellular spot and a brown angulated discal line; a grey interrupted submarginal line. Expanse 1 inch 8 lines.

Yokohama (*Jonas*).

229. *Cidaria cineraria*, n. sp.

Very closely allied to *C. picata*, but the markings blacker;

the central band of primaries not notched at the second median branch; all the yellow or yellowish olivaceous markings replaced by ashy grey: the white belt of secondaries wider, the body darker. Expanse 1 inch 4 lines.

Hakodaté (*Whitely*).

230. *Cidaria jameza*, n. sp.

Allied to *C. inspurcata*: primaries sepia-brown, crossed near the base by two irregular white lines, undulated and angulated above the median vein; two black-edged very irregular dentate-sinuate white discal lines, only separated by a brown centre line; a dentate-sinuate white submarginal line; centre of external area sprinkled with white scales; a black-spotted white marginal line; fringe spotted with whitish: secondaries grey; costal area, an angulated chain-like postmedian belt, a dentate-sinuate submarginal line and the margin white; a marginal series of black spots; fringe as in primaries: thorax brown, abdomen grey. Wings below with the basal area uniformly grey, limited externally by the discal line, which is represented by subconfluent black spots; discocellulars black. Expanse 1 inch 3 lines.

Hakodaté (*Whitely*).

Euboliidæ.

EUBOLIA, Duponchel.

231. *Eubolia niphonica*, n. sp.

Primaries with the basal two thirds smoky brown, blackish externally, and limited by an irregular bracket-shaped whitish line; external third paler white towards the border; two irregular arched whitish-edged black lines near the base; a black spot at the end of the cell; three or four subapical white dots; two black subapical spots: secondaries pale smoky brown, with a central whitish-edged dusky bracket-shaped line; outer margin white, dotted with black: thorax blackish, abdomen brown: under surface paler, the basal lines obsolete, the veins on the disk with reddish borders; black discocellular spots well-defined. Expanse 1 inch 6 lines.

Yokohama (*Jonas*).

Allied to *E. mæniaria*.